

Application No. 10/588,545
AMENDMENT dated April 11, 2012
Reply to Office Action of January 11, 2012
Attorney Docket 7383-88964-US

AMENDMENTS TO THE SPECIFICATION

On page 11 of the Specification, please replace the paragraphs beginning at lines 23 and 26 with the following amended paragraphs:

Figure 27 shows a schematic representation of a support element according to an embodiment of the present invention in use in a helicopter, and system with a valve,

Figure 28 shows a schematic representation of a support element according to an embodiment of the present invention in use in a helicopter, having four support structures,

Figure 29 shows a cross-sectional representation of a support system of one embodiment of the disclosure, and

Figure 30 shows a cross-sectional representation of a support system of Figure 29.

On page 13 of the Specification, please replace the paragraph beginning at line 12 with the following amended paragraph:

Figure 1B shows a variation of the embodiment shown in Figure 1A. In this case the structure that is supported by the support 26 is a table [[26]] 28.

On pages 16 and 17 of the Specification, please replace the paragraphs beginning at lines 16 and 31 with the following amended paragraphs:

Figure 5 shows a support element 110 for supporting a structure according to a yet another embodiment of the invention. Again, the support element 110 may function as support element 12 or 14 in the embodiment shown in Figures 1A and 1B and described above. The support element 110 comprises a cylinder [[122]] 112 in which a piston 114 is guided. The cylinder 112 has a fluid inlet/outlet opening (not shown) for receiving and ejecting fluid 118, such as a hydraulic liquid or water. The piston 114 has a seal 115 for sealing the fluid in the cylinder 112. The fluid inlet/outlet is connected to another such fluid inlet/outlet of another support element (not shown). In this embodiment the support element 110 comprises a surface

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contact portion 120 which is positioned below the piston 114 and around projection 122 of the piston 114.

The projection 122 has wedge-shaped side projections 124 and the surface contact portion 120 has wedge-shaped recesses 126. In this embodiment, the surface contact portion comprises two parts 120a and 120b. When the support element 110 is in an adjusted [[portion]] portion after movement of the piston 114 relative to the cylinder 112, the surface contact portion 120 contacts the surface and the movement of the surface contact portion therefore is restricted. The weight of the structure effects a further movement of the piston 114 in a downward direction against the surface contact portion 120 and the wedge portions 122 move parts [[120 A]] 120a and 120b apart from one another and towards the interior wall of the cylinder 112. In this embodiment, the lower part of the interior wall of the cylinder 112 has at least one tooth 128 on the surface and the parts [[120 A]] 120a and [[120 B]] 120b have toothed surfaces 130. When the parts [[120 A]] 120a and [[120 B]] 120b are moved towards the interior side wall of the cylinder 112, the teeth 128 engage with the toothed surface 130 and the engagement inhibits further movement of the piston 118 and the surface contact portion 120.

On pages 18 and 19 of the Specification, please replace the paragraph beginning at line 33 with the following amended paragraph:

Figure [[10] 11] shows two support elements 150 and [[150']] 150 incorporated into a table 161. The support elements 150 and [[150']] 150 are in fluid communication by means of fluid channel 163.

On page 19 of the Specification, please replace the paragraph beginning at line 4 with the following amended paragraph:

Figures 11-14 show a support element 170 for supporting a structure in more detail. The support element 170 comprises a cylinder 172 in which a piston 174 is guided. The cylinder 172 has a fluid inlet/outlet opening 176 for receiving and ejecting fluid 178, such as a hydraulic

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liquid or water. The fluid 178 is contained in a bladder 179. The fluid inlet/outlet 176 is connected to another such fluid inlet/outlet of another support element (not shown). In this embodiment the piston 174 has a cavity 180 having openings 182 and 184 at the side portions of the piston 184. Cavity 180 contains fluid 181, such as hydraulic fluid or water. In the openings 182 and 184 brake cylinders 186 and 188 are guided and if the fluid pressure in the cylinder 172 is above a threshold level, the brake cylinders 186 and 188 are pushed against the interior wall of the cylinder 172 so as to position the piston 174 in a stationary position relative the cylinder 172. The cavity 180 further includes seals [[189]] 197 for retaining fluid 181 within the cavity 180. The cylinder 172 also has a thread 173 for mounting on a structure. In the embodiment shown in ~~figure~~ Figure 14 the cavity fluid 181 is maintained in a bladder 183.

On page 20 of the Specification, please replace the paragraph beginning at line 10 with the following amended paragraph:

Figure [[15]] 17 shows detail of a support element 200 for supporting a structure in a further embodiment of the invention. The support element 200 comprises a cylinder 202 in which a piston 204 is guided. The cylinder 202 has a fluid inlet/outlet opening 206 for receiving and ejecting fluid 208, such as a hydraulic liquid or water. The fluid inlet/outlet 206 is connected to another such fluid inlet/outlet of another support element (not shown). The fluid inlet/outlet opening 206 includes a fluid inlet/outlet extension 207 which extends through a fluid chamber 209 of the cylinder 202

On page 20 of the Specification, please replace the paragraph beginning at line 28 with the following amended paragraph:

The fluid inlet/outlet extension 207 extends into the cavity 210 and to the fluid inlet outlet 206 such that the fluid enters the fluid chamber 209 after proceeding through the cavity 210 within the fluid inlet/outlet extension 207. Fluid inlet/outlet extension 207 includes a flexible portion [[208]] 213 which extends through the cavity 210.

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On page 21 of the Specification, please replace the paragraph beginning at line 16 with the following amended paragraph:

Figures [[16-18]] 18-20 show detail of a support element 220 for supporting a structure in a further embodiment of the invention. The support element 220 comprises a cylinder 222 in which a piston 224 is guided. The cylinder 222 has a fluid inlet/outlet opening 226 for receiving and ejecting fluid 228, such as a hydraulic liquid or water. The fluid inlet/outlet 226 is connected to another such fluid inlet/outlet of another support element (not shown). The fluid inlet/outlet opening 226 includes a fluid inlet/outlet extension 227 which extends through a fluid chamber 229 of the cylinder 222.

On page 22 of the Specification, please replace the paragraph beginning at line 24 with the following amended paragraph:

Figure [[18]] 20 shows a detailed view of a ball valve 236 within support element 220. Ball valve 236 comprises valve arm 238 which extends into cavity 230. When fluid pressure in the cylinder 222 increases piston plate 234 moves proximal to piston 224 actuating valve arm 238 to move. At a threshold pressure ball valve 236 closes inlet/outlet extension 227.

On pages 22 and 23 of the Specification, please replace the paragraph beginning at line 31 with the following amended paragraph:

Figure [[19]] 21 shows detail of a support element 240 for supporting a structure in a further embodiment of the invention. The support element 240 comprises a cylinder 242 in which a piston 244 is guided. The cylinder 242 has a fluid inlet/outlet opening 246 for receiving and ejecting fluid 248, such as a hydraulic liquid or water. The fluid 248 is contained in a bladder 249. The fluid inlet/outlet 246 is connected to another such fluid inlet/outlet of another support element (not shown). The fluid inlet/outlet opening 246 includes a fluid inlet/outlet extension 247 which extends through the bladder 249.

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On page 24 of the Specification, please replace the paragraph beginning at line 7 with the following amended paragraph:

Figure [[20]] 22 shows a lever braking means 300 in a support element. The support element 290 comprises a cylinder 292 in which a piston 294 is guided. The cylinder 292 has a fluid inlet/outlet opening 296 for receiving and ejecting fluid 298, such as a hydraulic liquid or water. The fluid 298 is contained in a bladder 299. The fluid/outlet 296 is connected to another such fluid inlet/outlet of another support element (not shown).

On pages 24 and 25 of the Specification, please replace the paragraph beginning at line 30 with the following amended paragraph:

Figure [[21]] 23 shows a valve element 310 of a support element for supporting a structure according to a yet another embodiment of the invention. The valve element 310 is positioned between two support elements (not illustrated). The valve element 310 comprises an upper fluid reservoir 311 and a lower fluid reservoir 312. A ceramic disk 313 is disposed between the upper reservoir 311 and lower reservoir 312. The valve element 310 further comprises two opposing pistons, upper piston 315 and lower piston 316. Upper piston 315 is positioned to be impacted by a change in pressure in upper reservoir 311. Lower piston 316 is positioned to be impacted by a change in pressure in lower reservoir 312. The ceramic disk 313 includes an upper reservoir aperture 320 and a lower reservoir aperture 321. The upper piston 315 includes an upper piston aperture 322 while the lower piston includes a lower piston aperture 323. The pistons 315 and 316 are biased by means of springs 318 and 319 such that when the pressure is below a threshold level in upper reservoir 311 the upper piston aperture 322 aligns with the upper reservoir aperture 320 allowing fluid to flow therethrough. Similarly when the pressure is below a threshold level in lower reservoir 312 the lower piston aperture 323 aligns with the lower reservoir aperture 321 allowing fluid to flow therethrough.

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On pages 25 and 26 of the Specification, please replace the paragraph beginning at line 31 with the following amended paragraph:

In Figure [[21]] 23, if the fluid in one adjustable leg is linked to the lower reservoir 312 and this leg is lifted, so that it no longer takes load, the fluid pressure between the lower piston 316 and the leg decreases. The tension of the spring 319 is set so that a pressure decrease will result in the lower piston 316 moving such that the lower piston aperture aligns with the lower reservoir aperture in the ceramic disk 313. This acts to allow fluid transfer between each of the legs. If, alternately, the leg associated with the upper reservoir 311 is lifted the fluid pressure between the upper piston 315 and the associated leg decreases, allowing the upper piston 315 to move to open the upper reservoir aperture 322.

On pages 26 and 27 of the Specification, please replace the paragraph beginning at line 12 with the following amended paragraph:

Figure [[22]] 24 shows a valve element 330 of a support element for supporting a structure according to a yet another embodiment of the invention. The valve element 330 is positioned between two support elements (not illustrated). The valve element 330 comprises an upper fluid reservoir 331 and a lower fluid reservoir 332. An upper gel element 333 is associated with upper reservoir 331 while a lower gel element 334 is associated with the lower reservoir 332. The gel elements 333 and 334 are shaped such that a force imbalance is created between the two sides of a gel element. Outside edges 335 and 336 of the gel elements have a greater surface area than the inner edges 337 and 338 have. If the pressure in upper reservoir 331 increases, the pressure on the outer edge 335 of upper gel element 333 produces a force imbalance resulting in the gel element 333 deforming to decrease the fluid flow between upper reservoir 331 and lower reservoir 332. The valve element 330 is adapted such that when both the lower reservoir 332 and upper reservoir 331 are above a certain pressure, the lower gel element 334 and upper gel element 333 deform to abut one another, preventing fluid flow between the lower reservoir 332 and the upper reservoir 331. If either the lower reservoir 332 or

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upper reservoir 331 loses pressure, the associated gel element will spring back to allow fluid to flow between the upper reservoir 331 and lower reservoir 332.

On pages 27 and 28 of the Specification, please replace the paragraph beginning at line 11 with the following amended paragraph:

Figure [[23]] 25 shows a valve element 340 of a support element for supporting a structure according to a yet another embodiment of the invention. The valve element 340 is positioned between two support elements (not illustrated). The valve element 340 comprises an upper reservoir 341 and a lower reservoir 342. An upper piston 343 is associated with upper reservoir 341 such that an increase in pressure in upper reservoir 341 impacts upper piston 343. Similarly, a lower piston 344 is associated with upper reservoir 342 such that an increase in pressure in lower reservoir 342 impacts lower piston 344. Each piston 343 and 344 is disposed between an inner membrane 345 and 346 and an outer membrane 347 and 348. The upper piston 343 and membranes 345 and 347 and lower piston 344 and membranes 346 and 348 are shaped such that an increase in pressure in the corresponding reservoir impacts the outer membrane 347 and 348 more than the inner membranes 345 and 346. A force imbalance is created between the two sides of each piston. As a result, if the pressure in upper reservoir 341 increases, the pressure on the outer edge of upper piston 343 produces a force imbalance resulting in the piston 343 moving inwards to decrease the fluid flow between upper reservoir 341 and lower reservoir 342.

On pages 28 and 29 of the Specification, please replace the paragraph beginning at line 19 with the following amended paragraph:

Figure [[24]] 26 shows a valve element 350 of a support element for supporting a structure according to a yet another embodiment of the invention. The valve element 350 is positioned between two support elements (not illustrated). The valve element 350 comprises an upper reservoir 351 and a lower reservoir 352. An upper piston 353 is associated with upper

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reservoir 351 such that an increase in pressure in upper reservoir 351 impacts upper piston 353. Similarly, a lower piston 354 is associated with upper reservoir 352 such that an increase in pressure in lower reservoir 352 impacts lower piston 354. Each piston 353 and 354 is disposed on one side of a deformable membrane tube 356 which allows fluid communication between upper reservoir 351 and lower reservoir 352. The upper piston 353 and lower piston 354 are shaped to have an outer edge 357 and 358 which is broader than the piston's inner edge 359 and 360. Hence an increase in pressure in the corresponding reservoir impacts the outer edge 357 and 358 more than the inner edge 359 and 360. A force imbalance is created between the two sides of each piston. As a result, if the pressure in upper reservoir 351 increases, the pressure on the outer edge of upper piston 353 produces a force imbalance resulting in the piston 353 moving inwards to decrease the fluid flow through the deformable membrane tube 356 between upper reservoir 351 and lower reservoir 352.

On pages 29 and 30 of the Specification, please replace the paragraph beginning at line 26 with the following amended paragraph:

Figures [[25]] 27 and [[26]] 28 show a valve element 370 of a support element for supporting a structure according to a yet another embodiment of the invention. In this embodiment, each leg 371-374 being supported includes a fluid bladder 375 and 375'. When pressurised the fluid bladders 375 take the load of the table leg. Each bladder 375 has two hose connections 376 and 377 allowing fluid transfer between the fluid bladders 375. The hoses 376 and 377 extend between the fluid bladders 375 such that for any given fluid bladder, one hose connection is controlled by a valve 378 and the other hose connection is open to the bladder.

On page 31 of the Specification, please replace the paragraph beginning at line 1 with the following amended paragraph:

Figures [[27]] 29 and [[28]] 30 show a support element incorporated into a helicopter landing structure 380. The helicopter landing structure 380 comprises two or more independent

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landing struts 382. Each landing strut 382 incorporates one or more support elements 400. In the case where one landing strut 382 incorporates more than one support element 400, the landing strut may be divided such that in use there are four or more independent landing elements.